

TITLE
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The Large Zenith Telescope Survey: a deep survey using a 6-m liquid mirror telescope

Rémi A. Cabanac

E.S.O., Alonso de Cordoba 3107, casilla 19001, Vitacura, Santiago 19, Chile

Paul Hickson

U.B.C., Dept. of physics and astronomy, Hennings Bld, Vancouver, V6T 1Z4, Canada

Valérie de Lapparent

I.A.P., 98 bis Bld Arago, 75014 Paris, France

Abstract. The Large Zenith Telescope Survey whose construction is almost completed (first light expected in spring 2002) near Vancouver (Canada) is designed to observe a total strip of $\sim 17' \times 120^\circ$ in 40 narrow-band filters spanning 4000-10000 Å. It will gather the spectrophotometric energy distributions of ca. 10^6 galaxies to redshifts $z \sim 1$, with redshift accuracy $\sigma_z = 0.01$ at $s/n=10$, $\sigma_z = 0.04$ at $s/n=3$, ca. 10^5 stars, and a large sample of QSOs, variable stars, and transient objects of the solar system. The survey is optimized for studying of the evolution of both the luminosity function and the clustering of galaxies to a redshift $z \sim 1$. It will also provide a complete and homogeneous sample of stars at various galactic latitudes useful for studying galactic structure, and it will be a good instrument for the monitoring of variable objects.

Table 1. The Large Zenith Telescope in numbers

Latitude	49°17'17.2"	Altitude	395 m
Median Seeing	0.9"	Mirror Diameter	6 m
CCD	Thinned 2k×2k	Image scale	0.495"/pix
CCD width	16.9'	Area covered/night	16.9'×80°
Limiting R mag	25.4	Lim. mag in filter 750 nm	24.4

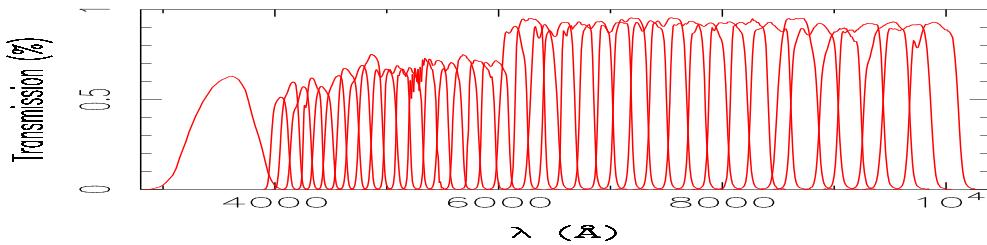


Figure 1. The transmission curves of the 40 narrow-band+U filters of the LZT.

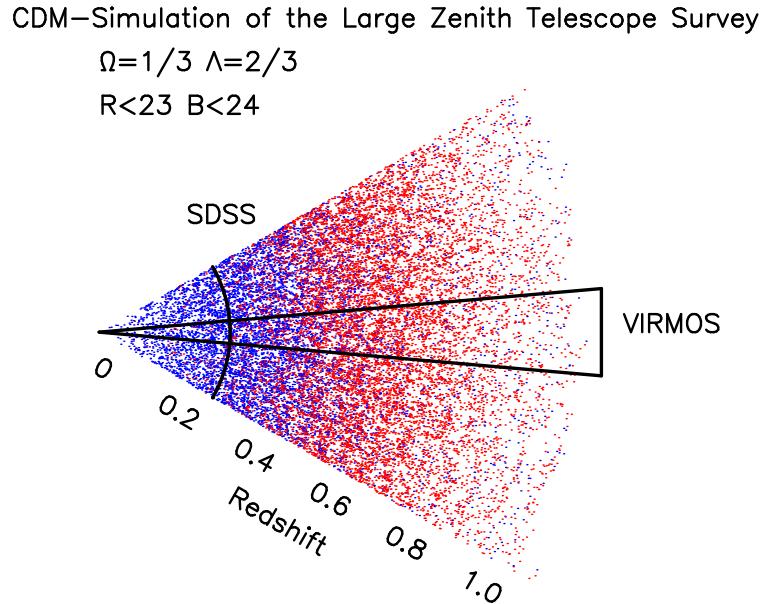


Figure 2. Mock LZT survey (courtesy of S. Hatton). Blue dots are galaxies bluer than $V - I < 1.4$, red dots are galaxies redder than $V - I > 1.4$. Overlaid are sketches of the areas of the spectroscopic surveys of SDSS and VIRMOS.

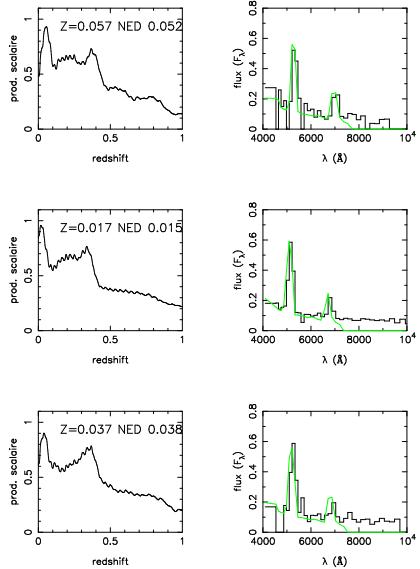


Figure 2. Three spectral energy distributions of HII/Seyfert galaxies from the UNMS1 (Hicksen & Mulrooney 1998) obtained with the NASA Orbital Debris Observatory 3-m liquid mirror telescope demonstrate the power of narrow-band filtering. The right panels show the UNMS1 spectra seen through 34 narrow-band filters (black line), with $H_{\beta} + [OIII]$ and H_{α} emission lines clearly visible. The 3 objects were identified in NASA/IPAC Extragalactic Database (NED), with names HS1314+3320, WAS69, and CASG466 (from top to bottom). The left panels show the result of a cross-correlation with MRK 59 HII galaxy (green line; Kennicutt, 1992), and indicate the resulting redshifts, as well as the spectroscopic redshifts from NED.

References

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